

ON SOME OPISTHOBRANCHIA FROM VICTORIA

By ROBERT BURN†

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INTRODUCTION

This paper presents the information gained from the examination of a collection of Opisthobranchia taken by the author at a number of localities along 120 miles of coastline centering on Port Phillip Heads, Victoria.

The results have been rather gratifying; 35 species, of which 10 are described as new, are recorded. One new genus is described and 22 recorded. Most specimens were collected at low tides under stones, but some were collected at dusk when the animals crawl about feeding on the various seaweeds. These nocturnal specimens were easily picked off the seaweed and placed in a jar of seawater for later study.

One comes to the conclusion from the type of species collected that the waters along the Victorian coastline are gradually warming up. Tropical and sub-tropical genera found here, although not as large as from warmer seas, are now appearing in our waters. Some such genera are *Aglaiia*, *Cyerce*, *Glossodoris*, *Thordisa*, *Madrella*, *Melibe* and *Hervia*. Some species prove so common all the year round that it seems unlikely that they should not have been previously recorded.

Since this paper was written, a further number of species have been collected which are not recorded in this paper; some appear to be new species. These will be presented in a later paper.

Dimensions mentioned in descriptions are of the largest specimens so far collected by myself.

Type specimens are to be presented to the National Museum, Melbourne, Victoria.

SYSTEMATIC LIST OF OPISTHOBRANCHIA FROM VICTORIA

* Denotes species not previously recorded from Victoria.

	Phylum	MOLLUSCA
	Class	GASTROPODA
	Subclass	OPISTHOBRANCHIA
I	Order	Cephalaspidea
	Sub Order	Philinacea
	Family	Philinidae
		<i>Philine angasi</i> (Cross & Fischer)
	Family	Aglaiidae
		* <i>Aglaiia taronga</i> Allan
II	Order	Anaspidea
	Family	Aplysiidae
		<i>Aplysia parvula</i> Morch
		* <i>A. angasi</i> Sowerby
III	Order	Sacoglossa
	Sub Order	Elysiacea
	Family	Calliphyllidae
		* <i>Cyerce nigra pallens</i> , subsp. nov.

† Geelong, Victoria, Australia.

IV	Order	Notaspidea
	Sub Order	Pleurobranchacea
	Family	Pleurobranchidae
		* <i>Pleurobranchus punctatus</i> Quoy & Gaimard
		* <i>Pleurobranchaea novaezealandiae</i> Cheeseman
V	Order	Nudibranchia
	Sub Order	Doridacea
	Super Family	Eudoridacea
	Group	Phanerobranchia
	Family	Euphuridae (= Polyceridae)
		* <i>Euphurus multidigitalis</i> , sp. nov.
		* <i>Palio cooki</i> (Angas)
		* <i>Nembrotha arnoldi</i> , sp. nov.
	Group	Cryptobranchia
	Family	Doridae
		* <i>Glossodoris victoriae</i> , sp. nov.
		* <i>G. tasmaniensis</i> (Bergh)
		* <i>Glossodoris perplexa</i> , sp. nov.
		* <i>G. haliclona</i> , sp. nov.
		* <i>G. alternata</i> , sp. nov.
		<i>Ceratosoma brevicaudatum</i> Abraham
		* <i>Rostanga arbutus</i> (Angas)
		* <i>Praegliscita</i> , gen. nov.
		Type species
		<i>Doris chrysotherma</i> (Angas)
		<i>Alloiodoris marmorata</i> Bergh
		<i>Staurodoris pustulata</i> (Abraham)
		<i>Archidoris varia</i> (Abraham)
		* <i>Thordisa sabulosa</i> , sp. nov.
		* <i>Halgerda graphica</i> Basedow & Hedley
		* <i>Dendrodoris aurea</i> (Quoy & Gaimard)
		<i>D. carneola</i> (Angas)
		<i>D. nigra</i> (Stimpson)
		* <i>D. staminea</i> (Basedow & Hedley)
		* <i>D. albopurpura</i> , sp. nov.
		* <i>D. davisii</i> Allan
	Sub Order	Aminacea
	Super Family	Pachygnatha
	Family	Madrellidac
		* <i>Madrella sanguinea</i> (Angas)
	Sub Order	Dendronotacea
	Family	Tethyidae (= Fimbriidae)
		* <i>Melibe australis</i> Angas
		* <i>M. pellucida</i> , sp. nov.
	Sub Order	Eolidacea
	Super Family	Cleioprocta
	Family	Facelinidac
		* <i>Hervia ornata</i> (Angas)
		* <i>H. newcombi</i> (Angas)
		* (?) <i>H. peonicia</i> , sp. nov.

VICTORIAN SPECIES

PHILINE ANGASI (Crosse & Fischer)

Bullaea angasi Crosse & Fischer, 1865, *Journ. de Conch.*, 13, p. 38, pl. 2, f. 8.

Large, elongate oval body, up to 60 mm. in length. Very slimy. Colour white with very little variation. Shell large, upward of 20 mm. long; internal, covering the posterior disk; transparent white in colour; large body whorl and aperture, very thin and frail. Radula formula 24 x 1.0.1.

Locality: Port Phillip Bay.

Station: Very common; sand bars; sandy mud flats and shallow water dredgings.

AGLAIA TARONGA Allan

Aglaia taronga Allan, 1933, *Rec. Aust. Mus.*, 18, No. 9, p. 444, pl. 56, f. 1-3.

Small; body cylindrical, divided into anterior and posterior disks. Shell very small, white, few whorled without a spire, on right hand side of rear of posterior disk. Gill long, plumose, passing across the body under the shell, protected by the tail lobes of the posterior disk. Colour velvet black, edges of lobes white with a secondary row of orange; either side of the anterior disk lined with an orange streak. There is an interrupted white hair line from the mouth to the very dark tail of the anterior disk. Upper exposed surfaces with general yellow flecking. Inner surfaces light grey. Size of above described specimen 22.5 x 9 mm.

Locality: Swan Bay, Port Phillip (1 spec. Dec., 1956).

Station: Very uncommon; crawling on *Posidonia* at low tide.

Remarks: There are probably a further two species of *Aglaia* occurring in Victoria, but at present they are undescribed or unidentified.

APLYSIA PARVULA Morch

Aplysia parvula Morch, 1863, *Journ. de Conch.*, p. 22.

Body small, up to 88 mm. in length; long narrow neck with large rhinophores and cephalic tentacles; parapodia medium, united behind, not used for swimming; mantle with a large aperture through which crown of shell protrudes; with a small purple gland; and a sucking disk on the posterior end of the foot. Colour fawn to dark brown, blotched with white; edges of parapodia, rhinophora, siphon and cephalic tentacles always edged with black. Mantle aperture edged with black, from which white patches radiate to give a rayed effect. Shell small, up to 22 mm. long by 10 mm. wide, strongly convex, horny and rather tough in texture; colour brown. Radula formula 15-20 x 12.1.12.

Locality: Torquay, Apollo Bay, Barwon Heads, Flinders.

Station: Common, under stones and crawling on weed on open coast reefs. During December, 1956, large number of minute specimens of this species were observed in every pool at Torquay; sizes ranged from 3 mm. to 10 mm. in length.

Remarks: *Aplysia norfolkensis* Sowerby, 1869, from Sydney, appears very similar to *A. parvula* Morch, a species of apparent world-wide distri-

bution. Radula features are similar, that of the latter ranging from 22 x 12.1.12 to 35 x 18.1.18, while the former is 15-20 x 12.1.12. It would then appear that *A. parvula* is the correct name, as it has six years' priority.

APLYSIA ANGASI Sowerby

Aplysia angasi Sowerby, 1869, *Conch. Icon.*, 17, pl. 8, sp. 35. Body small, plump or rounded, upward of 100 mm. Parapodia rather large, separated behind. Mantle aperture nearly closed, with a small papilla at the spot. Siphon large. Rhinophores long and linear. Cephalic tentacles short, irregular along the outer edges. Penis cylindrical, 10 mm. long; a curved spur 4 mm. long extends from the papilla on the round end. Penis protrudes from the genital groove anteriorly between the head and the foot. Foot without a sucking disk. Gill large, never extended or exposed. Shell small 25 x 17 mm., elongate-oval, slightly convex, thin, transparent and frail. Radula formula 33 x 25.1.25. Colour varying from fawn to brownish-green, always with a few darker brown patches on the parapodia and neck; exposed surfaces covered with fine, dark brown interlacing veins. Gill olive. Inner surfaces of parapodia fawn without markings. Foot yellow, vacant of markings. Shell brown.

Locality: Torquay (3 spec. Dec., 1956).

Station: Uncommon, clustered together under stone, mid-tide.

Remarks: Yet another species is recorded from Victoria as *A. tigrina* Rang (correctly *A. sowerbyi* Pilsbury). This is incorrect, as the Victorian species is not the same as the species from New South Wales. But until further material comes to hand the naming of the Victorian species must be left in abeyance.

CYERCE NIGRA PALLENS, subsp. nov.

(Pl. III, fig. 8-11)

General body shape typical of *Cyerce*, 50 mm. long and 20 mm. wide excluding the branchial papillae. Head with corners produced to form linear orals. Rhinophores solid, cylindrical, medium length, bifurcated at the upper end. Branchial papillae in eight rows along the mantle-margin; attaining largest size posteriorly in the inner row. Branchial papillae medium, foliaceous, caducous; consisting of a short stalk and a large broadly lachrymose leaf-like lamina, finely denticulated along margins; the liver ramifications visible in each lamina. Foot broad, antero-lateral corners nearly square, notched anteriorly, tapering to a blunt point behind. Genital orifice below and posterior to the rhinophores. Pericardium large, soft and balloon-like, pulsates as the animal breathes. Colour generally velvet-fawn, dorsum salmon pink flecked with white, foot fawn speckled with minute brown spots. Branchial papillae olive-fawn marked with short light blue streaks on the upper side, and on the reverse side with small light blue dots.

Locality: Queenscliff (4 spec. Oct-Nov., 1956; 5 spec. May, 1957).

Station: Rather rare, crawling on seaweed at extreme low tide.

Remarks: Differs from the true *C. nigra* Bergh, 1877, in being much paler, particularly in the dorsal area. The patterning on the branchial papillae also differs considerably from the true species in general position of markings. This variety may warrant specific rank rather than just varietal status. This is the most southern record of the genus and only the second record from Australia.

PLEUROBRANCHUS PUNCTATUS Quoy & Gaimard

Pleurobranchus punctatus Quoy & Gaimard, 1832, *Voy. "Astrolabe"* Zool., 2, p. 299, pl. 22, f. 14.

Body medium size, broadly oval, up to 44 x 32 mm., mantle large, twice as wide as foot. Ctenidium large, rachis smooth; always concealed under mantle. Rhinophores long, stout; cylindrical, longitudinally folded throughout their length. Eyes posterior to base of rhinophores. Shell small, $\frac{1}{4}$ - $\frac{1}{3}$ of body length, nearly square, but slightly narrower behind; very flat, of 1½-2 whorls, fragile. Colour pale cream to pale yellow. Shell transparent amber. Some specimens have white spots on the mantle.

Locality: Portarlington; Breamlea; Flinders; Lorne; Blanket Bay.

Station: Very common, under stones between tide levels; usually found in pairs.

Remarks: The egg ring, about 18 mm. diameter, of $\frac{3}{4}$ of one whorl, is a clear gelatinous mass enclosing the minute spheres of cream or yellow eggs. Egg rings were first observed in October, 1954, and in March, 1955, minute specimens up to 5 mm. in length appeared.

PLEUROBRANCHAEA NOVAEZEALANDIAE Cheeseman

Pleurobranchaea novaezealandiae Cheeseman, 1878, *Proc. Zool. Soc., Lond.*, p. 276, pl. 15, fig. 3.

Quite large, about 65 x 24 mm. Mantle small, not covering head or foot, but continued forward into the head-veil and posteriorly into the tail. Head-veil with corners produced to form linear tentacles; margin between tentacles finely serrated. Right margin of mantle extending over the large ctenidium. There is no shell. The sole of the foot has a pedal gland posteriorly. Colour yellowish-grey, exposed surfaces streaked with irregularly anastomosing lines of black; sole brown, ctenidium light grey. Radula formula 36 x 53-65.0.53-65 to 46 x 60-65.0.60-65.

Locality: Lorne, Apollo Bay (1 spec. from each locality, Dec., 1956).

Station: Uncommon, in sandy positions under stones near high water level.

Remarks: This species differs from the previous species in that it lacks a shell; the mantle is continuous anteriorly and posteriorly into the head and tail, and the peculiar lined colouring. The animal is predatory, eating other sea-slugs, etc., placed in an aquarium along with it.

EUPHURUS MULTIDIGITALIS, sp. nov.

(Pl. 11, fig. 1-6)

Animal limaciform, very small, about 10 x 2.5 mm. in size. Pallial ridge with 42 evenly spaced papillae, each one with 4 or 5 points resembling fingers. Dorsum separate from tail, irregularly and minutely pustulose. Foot long, narrow, deeply notched in front, foot corners rounded and curled back; grooved full length. Rhinophores small, retractile within sheathed cavities, obliquely laminated with 12 laminae. Branchiae 3, bipinnate, sub-retractile within a small crescent-shaped cavity. Orals formed by thickened outer lips of head. Genital opening midway along length of dorsum. Colour pale yellow; pustules clear, with a black spot in each; papillae black with clear tips; rhinophores, branchiae and foot white. Underside of mantle pale yellow speckled with black; a noticeable cluster of dots in front of the head.

Locality: Torquay (2 spec. Dec., 1955).

Station: Under stone at low tide.

Remarks: The only other Australian species to date, *E. yatesi* Angas, 1864, from Sydney, is much larger, with fewer papillae surrounding the dorsum.

PALIO COOKI (Angas)

Polycera cooki Angas, 1864, *Journ. de Conch.*, 12, p. 58, pl. V, f. 6.

Body small, limaciform, about 10 mm. in length and 3 mm. in width. Dorsum separated from sides by pallial ridge, but continuous into tail. Pallial ridge consists of a row of fine-pointed serrations which gradually die out posteriorly. Rhinophores large, sub-clavate, retractile, laminated with 8 very oblique laminae. Branchiae 5, bipinnate, retractile within a large crescent-shaped cavity. General body colour bright orange speckled with minute strawberry-red dots, foot white. Pallial ridge strawberry-red.

Locality: Breamlea (1 spec. Nov., 1955); Torquay (2 spec. Dec., 1955).

Station: Under stones near low tide.

NEMBROTHA ARNOLDI, sp. nov.

(Pl. II, fig. 13-14)

Body small, limaciform, dimensions up to 18 x 6 mm.; general form typical of *Nembrotha*. Body minutely spiculose. Rhinophores large, clavate, with 9 laminae, retractile within sheath cavities. Branchiae small, 5, tripinnate, sub-retractile arranged in a semi-circle about the small protrudent anus. Branchial cavity equipped with 3 flaps corresponding with the 3 central branchiae. Oral tentacles linear, but rather short. Genital opening large, sheathed; penis semi-transparent, stout at base and for half the length, then twisted to the rear and tapering to a sharp point. Colour varying from pink to dark brownish-red, sometimes with a few yellow markings on the sides. Rhinophores, branchiae, anal tube and orals yellow. Foot paler than upper surface, outlined with yellow.

Locality: Torquay (3 spec. Mar., 1 spec. Nov., 1956).

Station: Very uncommon, under stones at low tide.

Remarks: Differs from other Australian species in small size and rather dull colouring. This species is named in honour of the late Rev. John K. Arnold—a very good friend and capable teacher, who showed me how and where in conchological collecting.

GLOSSODORIS VICTORIAE, sp. nov.

(Pl. III, fig. 4)

Body medium size for the genus, about 30 x 7 mm., elongate-oval, mantle narrow. Dorsal surface of mantle with a few low postules, longitudinally ridged or grooved to give a rather flat corrugated appearance. Rhinophores medium, clavate, with 14 laminae, retractile. Branchiae 12, surrounding the anus. Colour white, tinted with pink; mantle and upper edge of foot encircled by a ring of large pink or red dots; grooves on mantle lined pale blue; postules on mantle tipped red. Rhinophora, branchiae, head and foot white. Radula formula 35 x 27.0.27.

Locality: Portarlington (3 spec.), Torquay (2 spec., type locality).

Station: Fairy common, under stones and on weed at low water.

Remarks: Differs from the next species in lacking red colour spots in the central dorsal area, and smaller size.

GLOSSODORIS TASMANIENSIS (Bergh)

(Pl. II, fig. 10)

Chromodoris tasmaniensis Bergh, 1905, *Reis. im. Arch. der. Phil.*, 6 (2), p. 69, pl. V, f. 12-15.

Body of above species, length up to 55 mm. Dorsal surface of mantle smooth. Rhinophores small, with 18-20 oblique laminae. Branchiae 10, surrounding large protrudent anus. Colour white, a single or double row of reddish-orange spots just inside the mantle margin; medium part of the back marked with reddish-orange spots, sometimes many, sometimes few. Upper edge of foot encircled by a row of spots as is mantle. Rhinophores white. Branchia white, rachis of each red on the inner side and with 2 red dashes on reverse side. Radula formula 42 x 34.0.34.

Locality: Torquay (1 spec. Mar., 4 spec. Oct., 1956).

Station: Common, under stones and crawling among seaweed.

Remarks: *G. tasmaniensis* Bergh, type locality Ulverstone, Tasmania, has not been collected since originally described in 1905. Specimens from Torquay, although showing certain colour variations, apparently belong to this species. Differs from the previous species in larger size and the smooth dorsal surface.

GLOSSODORIS PERPLEXA, sp. nov.

(Pl. III, fig. I.)

Body small, length up to 17 mm. General body-colour white, the median part of the back sparsely sprinkled with red spots; a row of purple markings just inside the mantle margin. Underside of mantle similar, but markings much fainter. Sides and tail with a few red spots. Tail faintly mauve. Rhinophores red, with 6-8 laminae. Branchiae 10, yellow.

Locality: Torquay (1 spec. Oct., 1956).

Station: Very rare, crawling on seaweed.

Remarks: Somewhat similar to *G. aureopurpurea* (Collingwood), but differs in being smaller and having red dorsal spots instead of yellow.

GLOSSODORIS HALICLONA, sp. nov.

(Pl. III, fig. 2)

Body small, length up to 15 mm. General body-colour bright pink; mantle margin edged with white, inside which is a second interrupted row of white; dorsal surface minutely spotted with red. Rhinophores large, with 8-9 laminae, yellowish-pink. Branchiae 8-9, pinnate, pink.

Locality: Portarlington.

Station: Rather uncommon, alive on pink sponge *Haliclona* found under stones below low tide.

Egg ring an incomplete ellipse, 4 mm. broad and 2 mm. high; eggs cream in a clear gelatinous mass.

Remarks: Allan, 1947, mentioned a small unnamed *Glossodoris* from Angourie which may be the same as this. The colours are similar except for the mantle margins, rhinophores and branchiae.

GLOSSODORIS ALTERNATA, sp. nov.

(Pl. I, fig. 10-11)

Body small, length up to 18 mm. General body-colour mauve; medium part of mantle an irregular area of orange, with a few bright

metallic green spots; remaining portion of mantle mauve broken by white patches, which appear to radiate from some central point. Underside of mantle similar. Rhinophores rather large, with 7 laminae. Branchiae small, 6, bipinnate, sub-retractile, white. Radula formula $40 \times 29.0.29$; outer teeth not denticulate.

Locality: Portarlinton (type locality); Torquay.

Station: Rather common, under stones and crawling on weed.

Remarks: A very distinctive little species not easily confused because of its striking colours. One specimen 12 mm. long from Portarlinton had both rhinophores emerging from the one large cavity; the right-hand rhinophore was bifurcated and had laminae on both heads.

CERATOSOMA BREVICAUDATUM Abraham

Ceratosoma brevicaudatum Abraham, 1876, *Ann. Mag. Nat. Hist.*, Ser. 4, p. 142, pl. 7, and f. 6.

Body smooth, rather hard in consistency, up to 100 mm. in length. Mantle produced posteriorly into a nipple-like protuberance. Tail half as long again as mantle. Branchial plumes large, many in number, intergrown at the base, simply pinnate, retractile, surrounding anus in a semi-circle. Rhinophores clavate, retractile, with many oblique laminae. Orals stout, tapering to blunt points. General body colour pinkish-orange, profusely spotted on the sides with small red and blue spots. Mantle margin reddish, with a few dark red spots and white patches. Median part of mantle with purple or mauve spots, both large and small. Rhinophores and branchiae red. Mantle tail bright red, seemingly pustulose. Radula formula $80 \times 140.0.140$.

Locality: Portarlinton; Shoreham; Flinders; San Remo.

Station: Fairly common, under stones between tides. One of the more common species in Western Port.

Remarks: After considering a large series of this species I have concluded that the small species from South Australia, *C. adelaidae* Basedow & Hedley, 1905, is but the juvenile of this species and should be reduced to synonymy.

ROSTANGA ARBUTAS (Angas)

Doris arbutus Angas, 1864, *Journ. de Conch.*, 12, p. 47, pl. 4, f. 4.

Length up to 40 mm., width up to 22 mm. Body broadly ovate. "Mantle covered everywhere with closely-set villous papillae strengthened by divergent spicules extending from base to apex. General integument also rich in spicules. Rhinophore—sheaths and branchial cavity papillate similarly to the general dorsum. Branchial plumes 6-9, bipinnate, arranged in a complete circle around the anus. Representative radula formula $60 \times 50-60.0.50-60$ " (Baba, 1949, p. 149). Oral tentacles linear. Rhinophores slit in front, apex cylindrical, with very many laminae. Colour variable; usually bright red; rhinophores red with slit and apex yellow; branchiae red; base of branchial plumes black in some specimens.

Locality: Breamlea (1 spec. June, 1955); Lorne (3 spec. Dec., 1956); Blanket Bay (1 spec. Dec., 1956).

Station: Not uncommon, under stones between tides; egg rings are bright orange-red, up to 15 mm. overall diameter, of 3 or 4 whorls; the eggs are laid vertically in double rows.

PRAEGLISCITA, gen. nov.

Type species—*Doris chrysoderma* Angas, 1864.

Animal elongate-oval, slightly narrower medianly; soft, highly convex. Mantle nodulose; nodules high, abrupt in form, apices rounded; interstices flat, smooth. Branchiae bipinnate, many in number, arranged in a complete circle around the anal papillae. Rhinophores conical-clavate, laminated. Rhinophoral and branchial cavities in centre of rather deep depressions; not sheathed but lips minutely papillate. Foot broad and flat. Head small; orals mere ridge-like expansions as in *Dendrodoris*. Genital orifice large, prominent, divided vertically by a thin membrane. Elements of labial disk simple. Radula consists of many rows of simply hamate teeth, no central tooth; first inner lateral broad with a minute hook, next four becoming narrower but ascending in size and length of hooks. Outer six descending sharply, set closely together; outer tooth minute, without a hook.

Remarks: This genus resembles *Rostanga* in the general shape of the mantle and the formation of branchial plumes, but, ventrally, it resembles *Dendrodoris* with a broad flat foot and simple ridge-like expansions for the oral tentacles.

PRAEGLISCITA CHRYSODERMA (Angas)

(Pl. 1, fig. 1-5)

Doris chrysoderma Angas, 1864, *Journ. de Conch.*, 12, p. 46, pl. 4, f. 3.

Body as for genus, up to 40 mm. in length and 16 mm. in breadth. Nodules large in median area of mantle and decrease in size towards the margins. Branchiae 7 in number, rather like segments of a cut orange with the vertical axis the rachis of each plume. Clavus of rhinophores a rounded-cone, on stalks narrower but same length as clavus; clavus with 15-20 laminae. General body-colour chrome yellow, nodules capped with white. Rhinophores and branchiae orange. Underside of mantle marked with vein-like muscle tracery. Radula formula 37 x 78.0.78; teeth as for genus.

Locality: Queenscliff (1 spec. April, 1956); Torquay (4 spec. Oct., 1956).

Station: Rather common, crawling on seaweed and stones.

Remarks: This species is apparently rare in the type locality, Sydney Harbour, as only a few specimens have been collected in the intervening 97 years since the type was taken.

ALLOIODORIS MARMORATA Bergh

Alloiodoris marmorata Bergh, 1905, *Reis, im. Arch. der Phil.*, 6, p. 42, pl. 3, f. 12-19.

Body elliptic, rather firm, up to 26 mm. long and 15 mm. broad. Mantle has a rather matt appearance. Foot notched anteriorly. Orals digitiform. Rhinophores clavate, retractile, laminated. Branchiae 7-8, retractile, tripinnate. General body colour grey, mantle and sole minutely speckled with dark brown; dorsal surface with numerous white spots, each surrounded by an area of dark brown. Underside of mantle marked with a few dark brown spots. Rhinophores and branchiae dark brown. Radula formula 39 x 19.0.19.

Locality: Portarlington; Sutherlands Bay, Phillip Island.

Station: Common, under stones between tides.

Remarks: This species, although rather drab dorsally, is very sharply defined ventrally.

STAURODORIS PUSTULATA (Abraham)

Doris pustulata Abraham, 1877, *Proc. Zool. Soc.*, p. 205, pl. 29, f. 18-19.

Length up to 45 mm., breadth 30 mm. Body broadly elliptic, rather firm. Mantle covered by numerous opaque warty tubercles of various sizes, sharply defined in appearance, larger on the median part, more numerous towards the margins. Rhinophores clavate, laminated, retractile. Branchiae 8, tripinnate, retractile along with the anal tube. Rhinophoral cavities each surrounded by a ring of pustules. Branchial cavity elliptic, transverse to the body, surrounded by a ring of postules. Foot narrow, upper laminae notched; orals stout, digitiform. General body-colour yellow-orange; rhinophores fawn; branchiae fawn or brown. Radula formula 26 x 38.0.38.

Locality: Flinders; Torquay; Blanket Bay.

Station: Extremely common, under stones near low tide level.

ARCHIDORIS VARIA (Abraham)

Doris variabilis Angas, 1864, *Journ. de Conch.*, 12, p. 44, pl. 4, f. 1, preocc.

Doris varia Abraham, 1877, *Proc. Zool. Soc.*, p. 209.

Body elongate-elliptic, wider in front than behind, up to 22 mm. in length. Mantle soft, covered with a multitude of varying-sized flat-topped nodulations; very close together. Branchiae 5, trippinnate, sub-retractile; anal papilla frilled around edge. Branchiae surround anus in a semi-circle. Rhinophores clavate, with 10-12 laminae, retractile within cavities lipped with a row of co-joined nodules. Foot narrow, bi-laminate; head large; orals large, broadly triangular. Colour fawn-orange or greenish-fawn, always appearing blotchy. Rhinophores and branchiae lighter than body-colour. Radula formula 37 x 65.0.65.

Locality: Breamlea (2 spec. Oct., 1956); Queenscliff (6 spec. Nov., 1956).

Station: Common, crawling on seaweed in pools.

THORDISA SABULOSA, sp. nov.

(Pl. I, fig. 6-9)

Length up to 22 mm., width 14 mm. Animal broadly oval or roughly square. Mantle entirely covered with thick-set pointed papillae, margins finely denticulate. Branchiae 6, bipinnate, retractile, surrounding anal tube. Branchial cavity with 6 distinct triangular lobes corresponding to the gaps between plumes. Rhinophores linear, clavus slightly larger than stalk, with approximately 20 very fine laminae, retractile. Foot narrow, grooved; head large, rounded; orals linear. General body colour ochraceous-yellow; dorsal papillae bright yellow; underside of mantle with numerous laterally-placed dark brown spots; rhinophores fawn, laminae of clavus dark brown; branchiae fawn. Radula formula 46 x 36-41.0.36-41. Teeth simply hamate, hooks very elongate. Innermost lateral minute, next 14 ascending in size: outer 6-7 laterals descending, faintly split at the tips.

Locality: Torquay (type locality, 1 spec. Nov., 1956); Queenscliff (1 spec. Nov., 1956).

Station: Rare, under stones in sandy positions, low tide.

Remarks: The animal exudes an adhesive fluid from the papillae on the mantle. These in turn become thickly encrusted with grains of sand and give the animal a much different appearance. This species, because of the spear-head papillae or spikes covering the mantle, cannot readily be confused with any other southern Australian nudibranch described to date.

HALGERDA GRAPHICA Basedow & Hedley

Halgerda graphica Basedow & Hedley, 1905, *Trans. Roy. Soc., S. Aust.*, 29, p. 152, pl. 3, f. 1-4.

Body small, soft, elliptic; up to 15 mm. in length. Mantle minutely granular. Rhinophores clavate, small, retractile, laminated. Branchiae 6, small, bipinnate, very distinct. General body-colour pale yellow; mantle with numerous evenly spaced black spots (without the red lines as has the type); underside of mantle with a number of black spots; foot and orals outlined with pale orange. Rhinophores and branchiae black. Radula formula 40 x 40.0.40.

Locality: Torquay (1 spec. Feb., 1954).

Station: Rare, under stone in running water, low tide.

DENDRODORIS AUREA (Quoy & Gaimard)

Doris aurea Quoy & Gaimard, 1832, *Voy. "Austrolabe," Zool.*, 2, p. 265, pl. 19, f. 4-7.

The species of this genus have the following characteristics in common: Body soft, slimy, elongate-elliptic; mantle broad, usually smooth; rhinophores large, laminated, retractile; branchiae large and bushy, up to 8 in number, tri- or quadripinnate, retractile, surrounding anal papillae. Foot broad and smooth; head small; orals short, ridge-like. There is no radula.

This species is about 55 mm. long. Head very small. Branchiae large and bushy, 5 in number. Rhinophores small for the size of the animal. Mantle smooth or minutely blistered. General body colour orange with or without small white patches on the mantle. Rhinophores and branchiae light brown.

Locality: Portarlington.

Station: Rather common, under stones between tides.

Remarks: Egg ring consists of 2 spiral whorls, overall diameter 50 mm., depth 10 mm., width 1 mm.; of some hundreds of vertical rows of minute yellow eggs, 15 eggs to a row.

DENDRODORIS CARNEOLA (Angas)

Doris carneola Angas 1864, *Journ. de Conch.*, 12, p. 48, pl. 4, f. 7.

Length up to 40 mm. Mantle tough. Back smooth or minutely granular. Branchial plumes 5, tripinnate. Head small, orals ridge-like. General body-colour dull red dorsally, yellow ventrally; specimens may be cream or orange. Rhinophores and branchiae brown.

Locality: Portarlington, Flinders

Station: Rather common, under stones between tides.

DENDRODORIS NIGRA (Stimpson)

Doris nigra Stimpson, 1855, *Proc. Acad. N.Sc., Philad.*, 7, p. 380.

Length up to 55 mm.; bath smooth, with a few indistinct large blisters. Branchiae 6-8, very large and bushy, quadripinnate. Colour velvet-black dorsally, lighter ventrally. Mantle, foot and orals outlined with crimson. Rhinophores grey, tipped with red; branchiae grey outlined with white.

Locality: Portarlinton (Jan.-Apr., 1954).

Station: Rather uncommon, under stones between tides.

Remarks: During the period mentioned above this species was very common, but since then has not again been collected. *Doriopsis australaensis* Abraham, 1877, p. 243, from N.S.W., is apparently the juvenile of this species.

DENDRODORIS STAMINEA (Basedow & Hedley)

Archidoris staminea Basedow & Hedley, 1905, *Trans. Roy. Soc., S. Aust.*, 29, p. 151, pl. 6, f. 3-4.

Length up to 22 mm. Mantle covered with very numerous small tubercular elevations and depressions; to the touch rather like medium sandpaper. Underside of mantle with the distinctive "vein-like threadlets" of the type description. Rhinophores clavate, retractile, laminated. Branchiae 5, small, tripinnate, retractile. Orals rounded rather like leaves. General body-colour yellow or white, occasionally streaked with red. Rhinophores and branchiae brown or yellow.

Locality: Portarlinton; Flinders.

Station: Common, under stones between tides.

Remarks: This species was originally described as *Archidoris*, and as there is no radula mentioned I assume that the species was placed there only by external features. Upon dissection of specimens I find there is no radula, which places the species in *Dendrodoris*.

DENDRODORIS ALBOPURPURA, sp. nov.

(Pl. III, fig. 3, 12)

Length up to 75 mm. Back covered by numerous large, flat, blister-like postules. Rhinophores large, retractile, with 12 laminae; clavus at right-angles to stalk. Branchiae 5, large and bushy, tri-pinnate. Foot narrower in front than behind. Head small; orals ridge-like as usual. General body-colour dirty white (pale grey); each blister-like pustule capped with a purple spot. A few brown spots, each surrounded by a white area, are scattered over the median part of the back. Underside of mantle and sides of foot scattered with a number of minute brown spots. Clavus of rhinophores purple, stalks white. Branchiae white. General shape when crawling very elongate.

Locality: Flinders

Station: Rare, under stones at extreme low tide.

Remarks: This species has very little adhesion in the foot. Specimens are collected in the swirling water and sand beneath upturned stones. In an aquarium this species is very active. This species differs from the other Victorian species in its larger size, bent rhinophores and lack of adhesion in the foot.

DENDRODORIS DAVISI Allan

Dendrodoris davis Allan, 1933, *Rec. Aust. Mus.*, 18, No. 9, p. 447, pl. 56, f. 13-14.

Length up to 20 mm. Mantle broad, soft; "densely covered with large, soft, raised pustules, with smaller ones between them" (Allan, 1933, p. 447). Branchia large, 5, tripinnate, retractile. Rhinophores large, with 8 laminac, retractile. Head large, orals ridge-like as usual. General body-colour dirty yellow; median part of mantle greenish. Rhinophores and branchiae dirty yellow, sometimes tinged green.

Locality: Portarlington.

Station: Common, under stones near low tide level.

Remarks: The pustules on the back accumulate a brown mucous or sediment, which is particularly noticeable on the median part. This species, except for its softness, would pass as small specimens of *Staurodoris pustulata* Abraham; the pustules on the back are similarly placed and the colours are somewhat the same.

MADRELLA SANGUINEA (Angas)

Janus sanguineus Angas, 1864, *Journ. de Conch.*, 12, p. 63, pl. 6, f. 5.

Up to 10 mm, long, 3 mm. wide. Aclidiform; head expanded into a semi-circular veil in front, large; foot broad, with 3 grooves in front, tapering sharply behind. Mantle lachrymose in shape, surrounded by 3 or more rows of non-caducous branchial papillae. Papillae fusiform; outer row short and stout; inner row long, some papillae crossing over the dorsum. Rhinophores claviform, upper half surrounded by a single row of closely-set papillae. The whole animal, particularly the papillae, exudes a bright red fluid when irritated. General body-colour blood red as the specific name implies. Radula formula 36 x 1.1.1.

Locality: Torquay (1 spec. Mar., 1956); Breamlea (1 spec. Oct., 1956).

Station: Rare, under stones and crawling on seaweed in rock pools, low tide.

Remarks: This species is also recorded from Japan.

MELIBE AUSTRALIS Angas

(Pl. I, fig. 12)

Melibea australis Angas, 1864, *Journ. de Conch.*, 12, p. 62, pl. 6, f. 2.

Very small, up to 15 mm. in length. Head expanded into a very large, trumpet-like veil or hood; inner margin lined with a single row of short, stout cirri or tendrils. Rhinophores on long, trumpet-like stalks arising from the hood. Cerata in 4 pairs on back; upper flat end of each pitted with small holes. Dendritic papillae thickly set on median part of back between cerata. Whole body except sole minutely granular. Foot very narrow, sharply pointed in front and behind. Liver-diverticula follicular. Body-colour dirty yellow-cream, cerata dark internally from liver.

Locality: Torquay (2 spec. Oct.-Nov., 1956); Queenscliff (9 spec., Nov., 1956).

Station: Occasionally common, crawling on brown seaweed or under stones.

Remarks: Egg ring small, an incomplete ellipse, diameter 4.5 mm. and 3 mm., depth 3 mm.; eggs white, in a clear gelatinous mass. This species is apparently rare in New South Wales.

MELIBE PELLUCIDA, sp. nov.

(Pl. III, fig. 5-7)

Small, very elongate, length up to 40 mm. Hood very large, notched dorsally and ventrally; cirri arranged on the hood margin in one row, rather long and thin. Cerata in 6 pairs, not easily falling off. No dentritic papillae. Cerata large, about one-quarter of body-length, rather narrow for length, apices pointed; everywhere covered with sharp-pointed tubicles. Foot extremely narrow, rounded in front, pointed behind. Rhinophores large, on very long stalks surmounted by a cup-like shield; between shield and base of stalk, posteriorly, is a delicate but voluminous veil-like membrane, edge of which is minutely serrated; clavus of rhinophores small, with 5-7 laminae. Liver-diverticula flocculent. General body-colour transparent pale yellow or orange, longitudinally lined with bright yellow streaks, everywhere flecked with minute red dashes. Apices of first pair of cerata usually red.

Locality: Torquay (6 spec. Nov.-Dec., 1956).

Station: Uncommon, under stones between tides.

Remarks: In an aquarium, this species is very active, swimming from the bottom to the surface with a graceful exhibition of twisting and turning. The animal swims on its side, starting off by lifting its head and tail until they nearly touch; then it thrusts downwards and so lifts its body. This is quickly repeated again and again till the animal has reached the surface or has touched something and adhered to it. From *M. australis* Angas this species differs in being larger, with a greater number of cerata, and lack of dentritic papillae on dorsal surface.

HERVIA ORNATO (Angas)

Flabellina ornata Angas, 1864, *Journ. de Conch.*, 12, p. 67, pl. 6, f. 7.

Length up to 22 mm. Rhinophores with 9 rings; cephalic tentacles linear. Body shape acolidiform. Branchial papillae in 9-10 groups on either side, in a double row in the first three groups. There are 18 papillae in the first group, about 15 in the second, about 12 in the third to fifth, thus decreasing in number backwards; on horseshoes in the anterior groups, the rest on mere oblique rows. Penis large, transparent light blue, narrow at base, becoming very broad and tapering slightly to a rounded end, on which is a nipple-like protuberance; a minute yellow tube passes through the penis to the nipple. Branchial papillae rather stout, pointed, very dark internally, externally flecked with orange, red, brown, yellow, green and blue. Foot corners broadly tentaculiform. Body-colour usually orange or yellow flecked with fawn or white. The multi-coloured papillae are very distinctive.

Locality: Torquay; Breamlea; Blanket Bay; Sutherlands Bay, Phillip Island.

Station: Common, under stones and crawling on weed between tides.

Remarks: Egg ring consists of 4 flat concentric rings of pink eggs, 8 mm. diameter. From the following species, this is larger, with a greater number of branchial papillae; the rhinophores are annular in form and the colouring is brighter.

This species and the next, although originally described as *Flabellina* Cuvier, 1830, are here placed in *Hervia* Bergh, 1871, as the positioning of the branchial papillae are better suited for this genus

HERVIA NEWCOMBI (Angas)

Flabellina newcombi Angas, 1864, *Journ. de Conch.*, 12, p. 68, pl. 6, f. 8.

Length up to 15 mm. Rhinophores with 4 encircling rings of nodular papillae; cephalic tentacles stouter than the above species. Branchial papillae in 4-5 groups on either side, first 2 groups set on horseshoes, rest on oblique rows. About 12 papillae in the first group, 10 in the second. Branchial papillae stout, apices rounded; extremely dark internally (greenish-black), externally devoid of colour. Foot corners narrowly tentaculiform. Body-colour pale green maculated with cream.

Locality: Portarlington, Breanlea, Flinders.

Station: Rather rare, under stones at low tide.

(?) *HERVIA PEONICIA*, sp. nov.

(Pl. II, fig. 7-10)

Length up to 23 mm., extremely narrow. Rhinophores smooth on leading edge, with 8-12 rows of small nodules on the posterior edge; cephalic tentacles extremely long and narrow. Branchial papillae in 7 groups, four papillae in the first and second, 3 in the third to fifth, 2 in the sixth and one in the seventh. In a single row in each group. Genital orifice below posterior part of first right group. Papillae long, slender, apices, acutely pointed; nearly transparent. Foot-corners very narrowly tentaculiform; foot narrow, grooved. Body-colour pale mauve, with two bright purple patches in front of the rhinophores. Rhinophore base mauve, nodules light green, apex yellow. Papillae bright transparent red tipped with yellow.

Locality: Breanlea (type locality, 4 spec. Oct., 1956); Portarlington (5 spec. Oct., 1956).

Station: Occasionally common; crawling on seaweed in pools at Breanlea; under stones between tide levels at Portarlington.

Remarks: From *H. onata* and *H. newcombi*, this species differs in being very narrow, the small number of slender papillae and the arrangement of the papillae along either side. Provisionally placed in *Hervia* till a better genus can be found.

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EXPLANATION OF PLATES

Plate I.

1. *Prægliscita chrysoderma* (Angas) —dorsal view with branchiae closed.
2. " " " " —ventral view of anterior part.
3. " " " " —half row of radula.
4. " " " " —rhizophore.
5. " " " " —detail of open branchiac.
6. *Thordisa sabulosa*, sp. nov. —dorsal view.
7. " " " " —ventral view of anterior part.
8. " " " " —half row of radula.
9. " " " " —rhizophore.
10. *Glossodoris alternata*, sp. nov. —dorsal view.
11. " " " " —ventral view.
12. *Melibe australis* Angas " —dorsal view

—Del. R. Burn.

Plate II.

1. *Euphurus multidigitalis*, sp. nov. —dorsal view.
2. " " " " —ventral view.
3. " " " " —detail of pallial ridge.
4. " " " " —rhizophore.
5. " " " " —detail of pustules on dorsum.
6. " " " " —branchial plumes.
7. (?) *Hervia peonicia*, sp. nov. —dorsal view.
8. " " " " —ventral view.
9. " " " " —rhizophore.
10. " " " " —branchial papillae first right group.
11. *Glossodoris tasmaniensis* (Bergh) —dorsal view.
12. " " " " —ventral view.
13. *Nembrotha arnoldi*, sp. nov. —right lateral view.
14. " " " " —ventral view of anterior part.

—Del. R. Burn.

Plate III.

1. *Glossodoris perplexa*, sp. nov. —dorsal aspect.
2. *Glossodoris haliclona*, sp. nov. —dorsal aspect.
3. *Dendrodoris albopurpura*, sp. nov. —dorsal aspect.
4. *Glossodoris victoriae*, sp. nov. —dorsal aspect.
5. *Melibe pellucida*, sp. nov. —right lateral aspect.
6. " " " " —detail of rhizophore.
7. " " " " —detail of cerata.
8. *Cyerce nigra pallens*, subsp. nov. —upper side of lamina.
9. " " " " " " —reverse side of lamina.
10. " " " " " " —liver ramifications.
11. " " " " " " —ventral view of anterior part.
12. *Dendrodoris albopurpura*, sp. nov. —detail of rhizophore.

—Del. R. Burn.

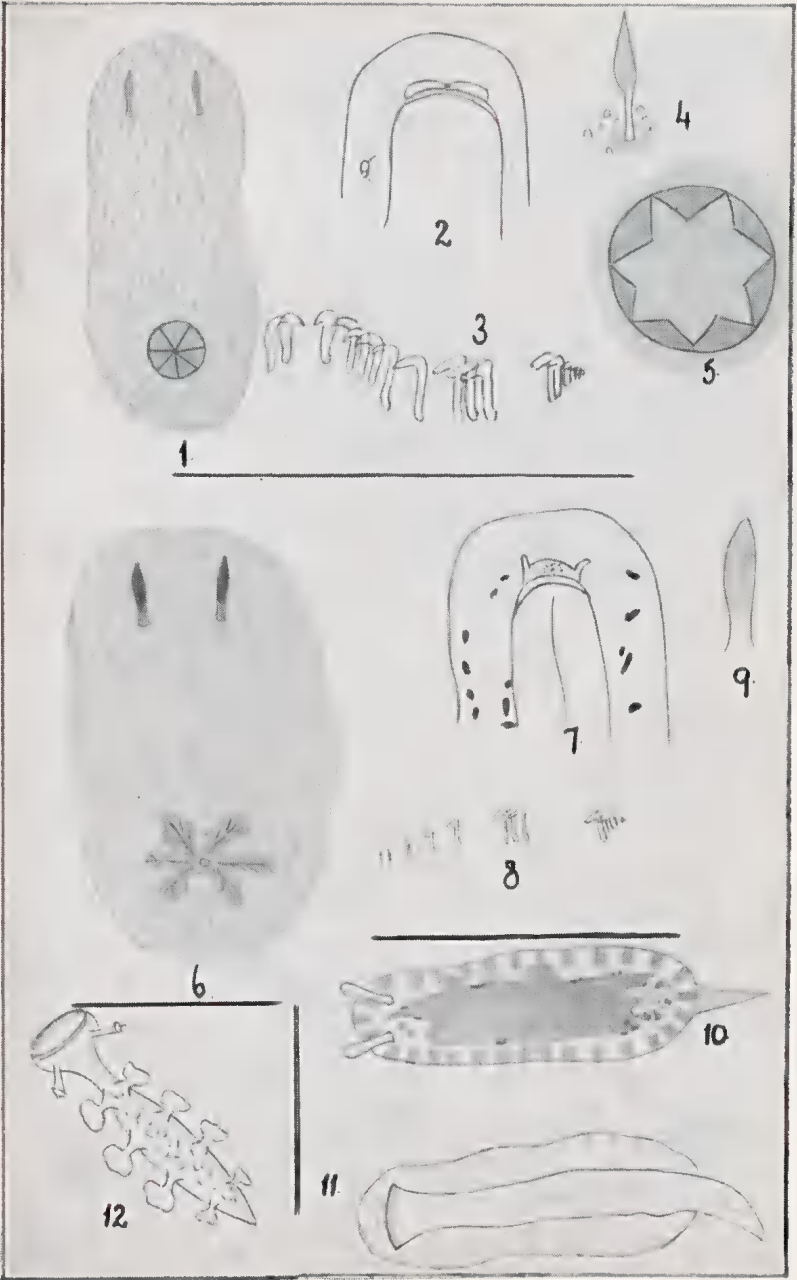


Plate 1.

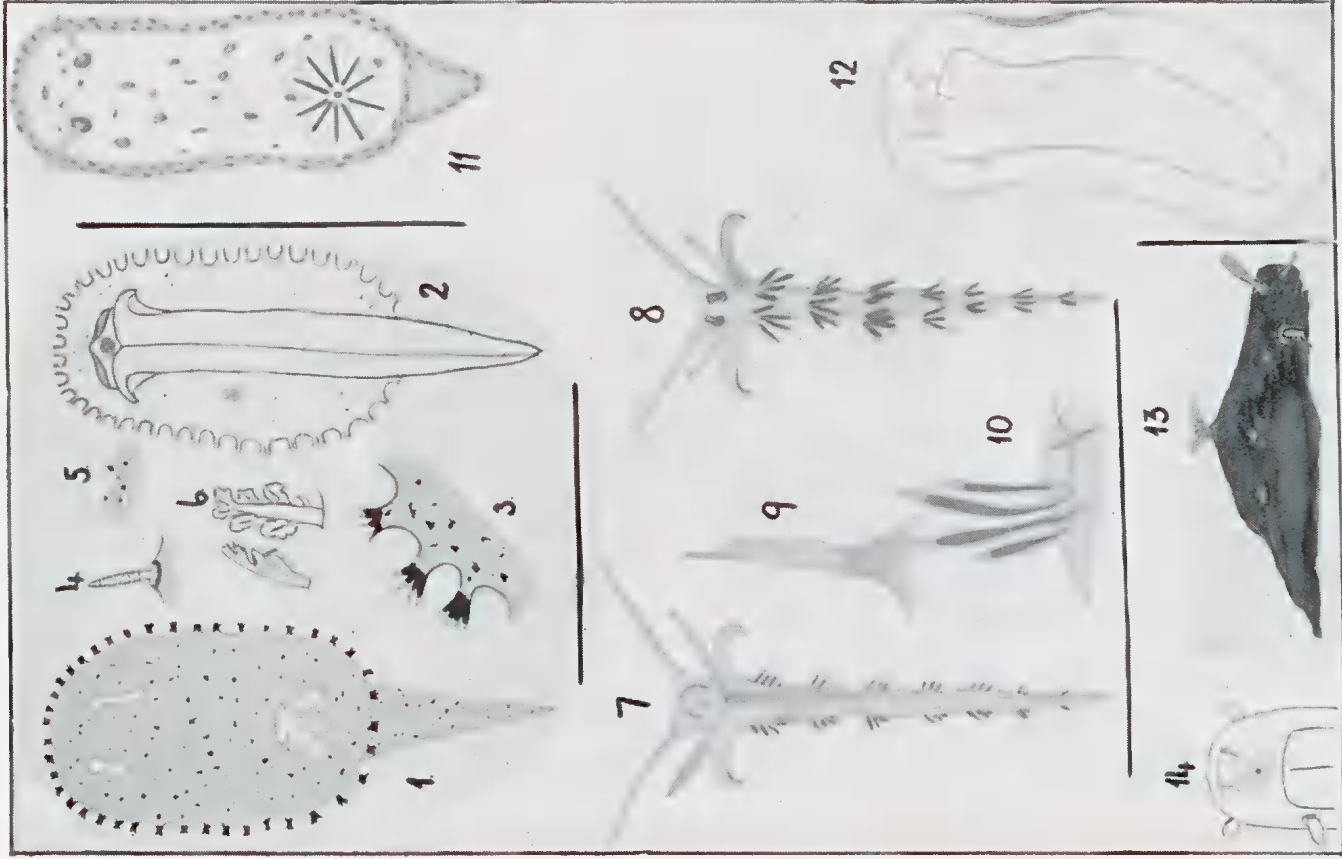


Plate 2.

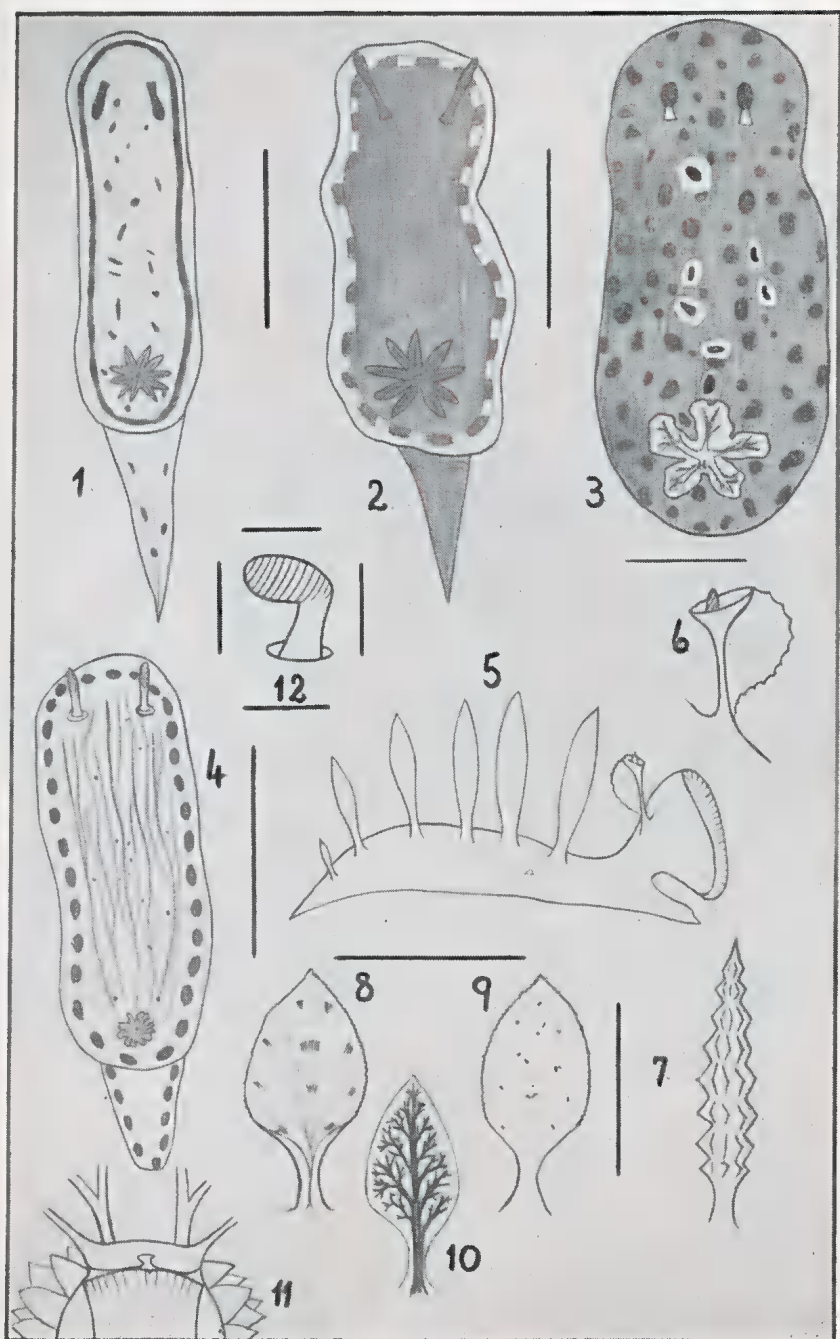


Plate 3.